

ATLAS



GEOLOGY AND MINING
INDUSTRY OF LEADVILLE
COLORADO

BY

S. F. EMMONS



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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
CLARENCE KING DIRECTOR

ATLAS

TO ACCOMPANY A MONOGRAPH

ON THE

GEOLOGY AND MINING INDUSTRY

OF

LEADVILLE

COLORADO

BY

SAMUEL FRANKLIN EMMONS



WASHINGTON
1883

JULIUS BIEN & CO LITH NEW YORK

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Map Collection

Book 2

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LEGEND.

TOPOGRAPHY

The map of Central Colorado is a reproduction of a portion of the Hayden Atlas, corrected topography having been introduced in the areas covered by maps of this Division, of the Mosquito Range, and of the Ten-mile District.

The maps of the Mosquito Range and of Leadville and Vicinity were made by A. D. Wilson, Chief Topographer, with assistants Reichel, King, and Holman; the former by a triangulation based upon geodetic points determined by the Hayden Survey, elevations being obtained by depression angles from points of known altitude; the latter by triangulation developed from a base measured at Leadville, slopes and elevations being determined by numerous profiles run with the level. The elevations, indicated by imaginary horizontal lines at stated vertical intervals, known as contours, are given as above mean sea level, the original datum point from which they were calculated being the threshold of the First National Bank in Leadville. The altitude of this point is assumed as 10,125 feet, which is the mean of three determinations obtained by connection with three points to which level lines had been run, viz., benchmarks of the Colorado Central and Denver & Rio Grande Railroads, and the summit of Mt. Lincoln. Where numbers denoting altitude are given in only three figures, they are to be taken as so many feet above the 10,000-foot contour. Shafts and tunnels are indicated by small circles on the Leadville map; when these are full it indicates that the mine was producing ore at the time of location. They are numbered independently in each lettered square, formed by meridians and parallels of latitude; names corresponding to each number, where known, will be found in the Index. They were located by Wm. H. Leffingwell.

Of the mine maps, the topography of those of Fryer and Carbonate Hills is by Mr. Wilson; the mine workings were compiled and drawn, in great measure from their own surveys, by G. H. Robinson and F. G. Bulkley, respectively.

Both topography and mine workings of the two Iron Hill maps are by H. Huber.

All profiles are constructed from the maps with equal vertical and horizontal scales. The scales to which the respective maps are drawn are as follows: CENTRAL COLORADO—About 4 miles to one inch, or $\frac{1}{350,000}$. Contours at 200 feet vertical interval.

MOSQUITO RANGE—Topographical, one mile to one inch, or $\frac{1}{45,000}$. Geological, a half mile to one inch, or $\frac{1}{22,500}$. Contours, 100 feet.

LEADVILLE AND VICINITY—Eight hundred feet to one inch, or $\frac{1}{90,000}$. Contours, 25 feet vertical interval.

MINE MAPS—One hundred and sixty feet to one inch, or $\frac{1}{18,000}$. Contours, 10 feet vertical interval.

GEOLOGY

In field work, and in the preparation of all maps, the geologist in charge has been most efficiently aided from the beginning by assistant geologist Ernest Jacob. Assistant geologist Whitman Cross and Prof. Arthur Lakes took part in the field work of the Mosquito Range. All lithological determinations have been based on microscopical examinations by Mr. Cross. All palæontological determinations were made by Prof. R. P. Whitfield.

Geological colors on the surface maps give the form of outcrops, projected on a horizontal plane, as they would appear if all loose detrital material were removed. Where the recent formations, however, are of sufficient importance, they are shown in the cross-sections.

On the Mosquito Map, the formations Weber Grits and Weber Shales are both included under the color of the former; so the Mt. Zion Porphyry is included under the color of the White Porphyry, and all other varieties indicated by the single color p.

On the Leadville maps, the color q p denotes only the main intrusive sheet of Gray Porphyry, other smaller bodies of this rock which do not form part of this sheet being indicated by the color p.

All cross-sections are drawn to natural scale, and the thicknesses there given to sedimentary formations are averages obtained from several measured sections. Data in regard to depths, faults, and folds, are, in the vicinity of Leadville, mainly derived from underground workings. Where these occur on or near the plane of a section, they are indicated thereon in full or dotted lines respectively.

The inclination of sedimentary beds is indicated by a line in the direction of the strike, crossed by an arrow in the direction of the dip, whose length is inversely proportional to the angle with the horizon.

Fault plane intersections are given in heavy black lines; lines of cross-sections in blue. Other special conventional signs are indicated on the respective maps.

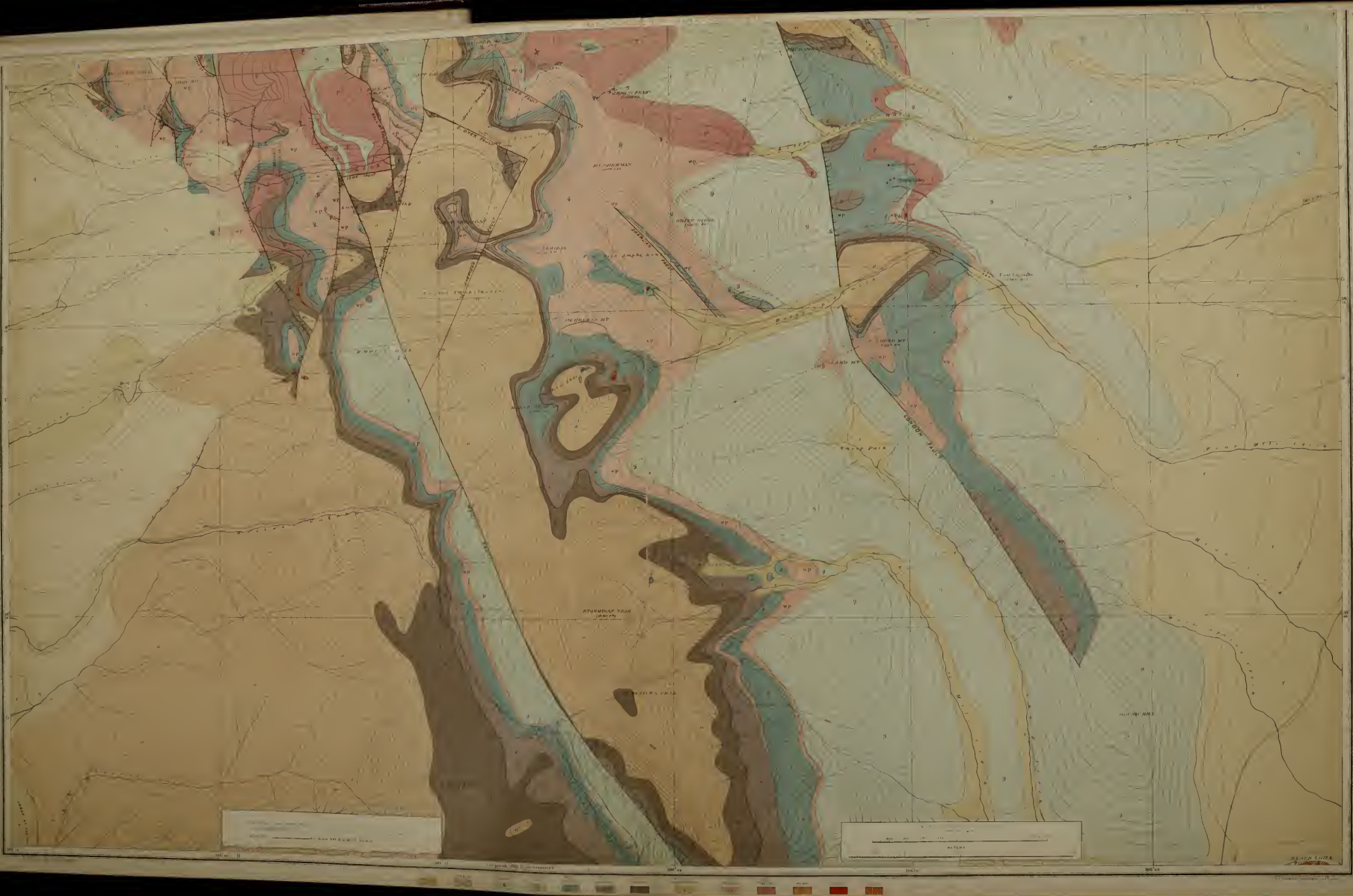
The following legend gives the local names of all formations and rocks represented on the maps, and their respective letters, grouped systematically.

SEDIMENTARY										IGNEOUS										
QUATERNARY		PALÆOZOIC								SECONDARY						TERTIARY				
POST-GLACIAL, GLACIAL		CARBONIFEROUS				SILURIAN		CAMBRIAN		ARCHÆAN		DIORITIC-LASTIC			PLAGIOCLASTIC			OUTROCCASTIC		
Cement	Lake Beds	Upper Coal Measures	Weber Grits	Weber Shales	Blue Limestone	Darkish Quartzite	White Limestone	Lower Quartzite	Granite and Schists	McDunn Porphyry	White Porphyry	Green Porphyry	Cyaniferous Porphyry	Sacramento Porphyry	Other Porphyries	Diorite	Porphyrite	Ultradiorite		
c	g	b	d	f	e	a	c	h		qp	pp	gp	pp	sp	p	ds	pr	eh		





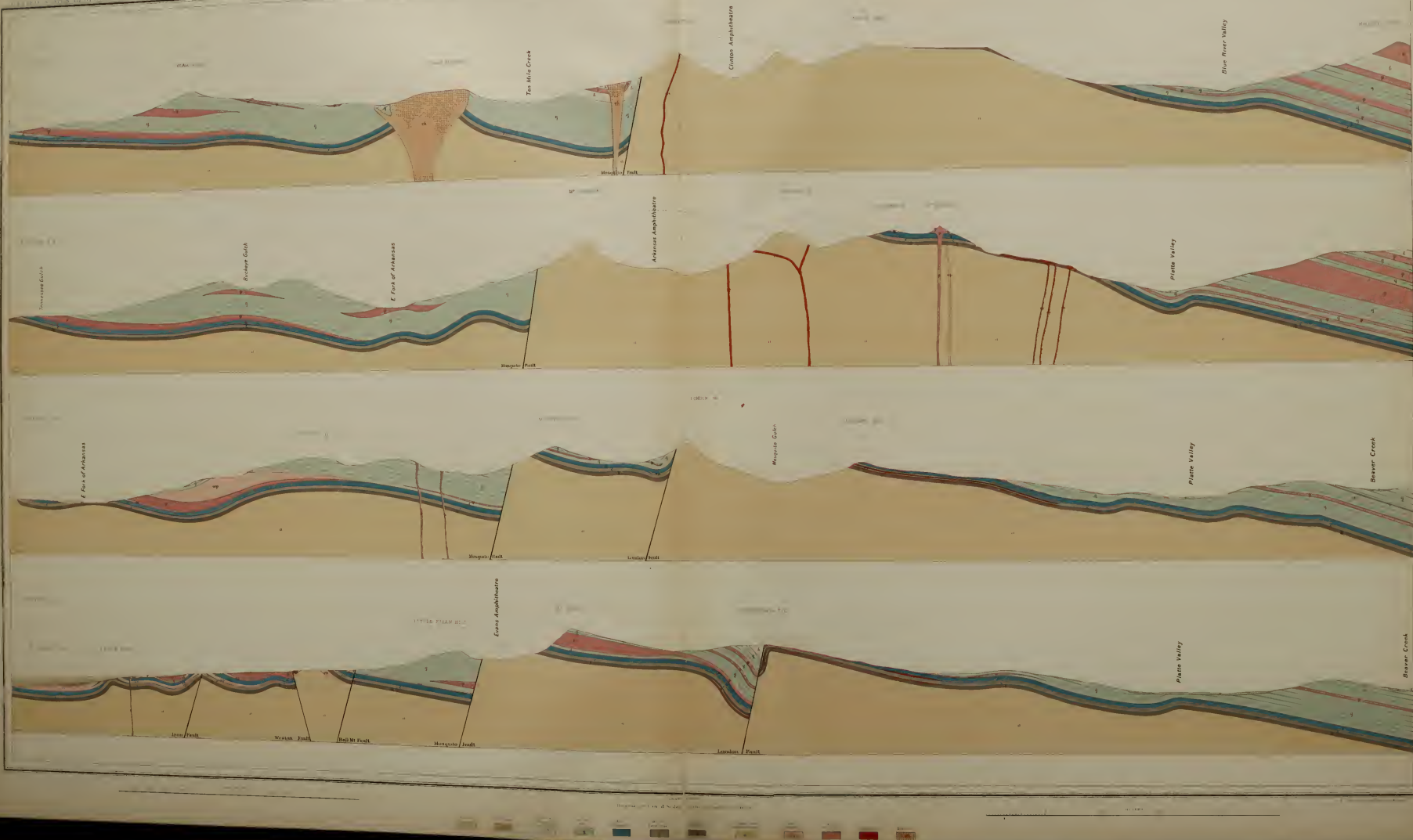


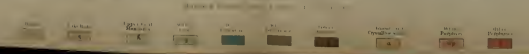
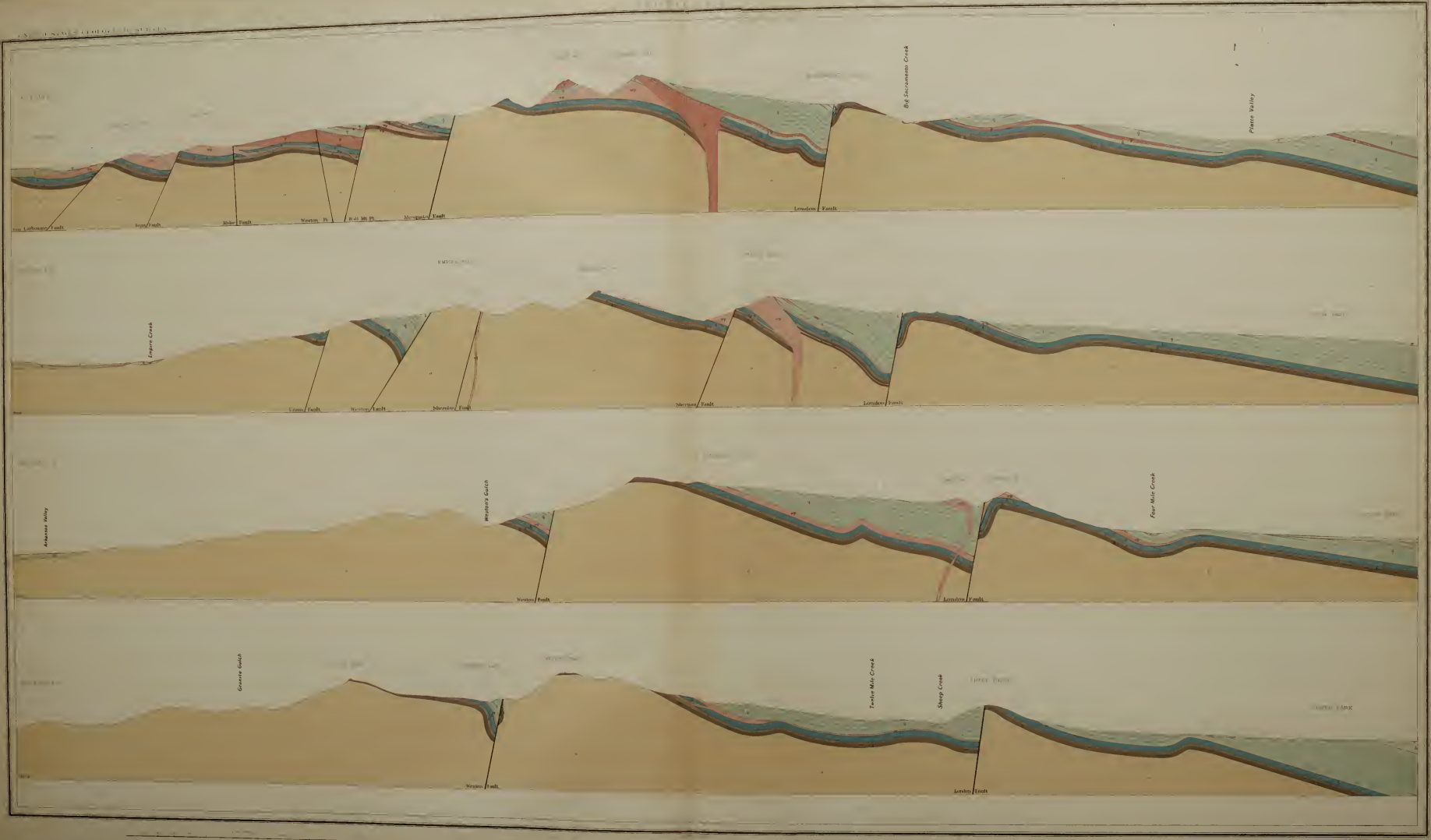


MOSQUITO RANGE

GEOLOGICAL AND PLANTYVILLE ALBANY, N.Y.

2a





MOSQUITO RANGE

SECTION - North half

Platte Gulch

Buckskin Gulch

Mosquito Gulch

Big Sacanento Gulch

SECTION - East half

Horseshoe Gulch

Little Platte Valley

Sherman Fault

Grisham Fault

East fork of Arkansas

LINK

Mosquito Fault

SECTION

MT. CAMEFON

MT. F

FLATE

AMPHITHEAT

DUHLE

Lower Gulch

10000

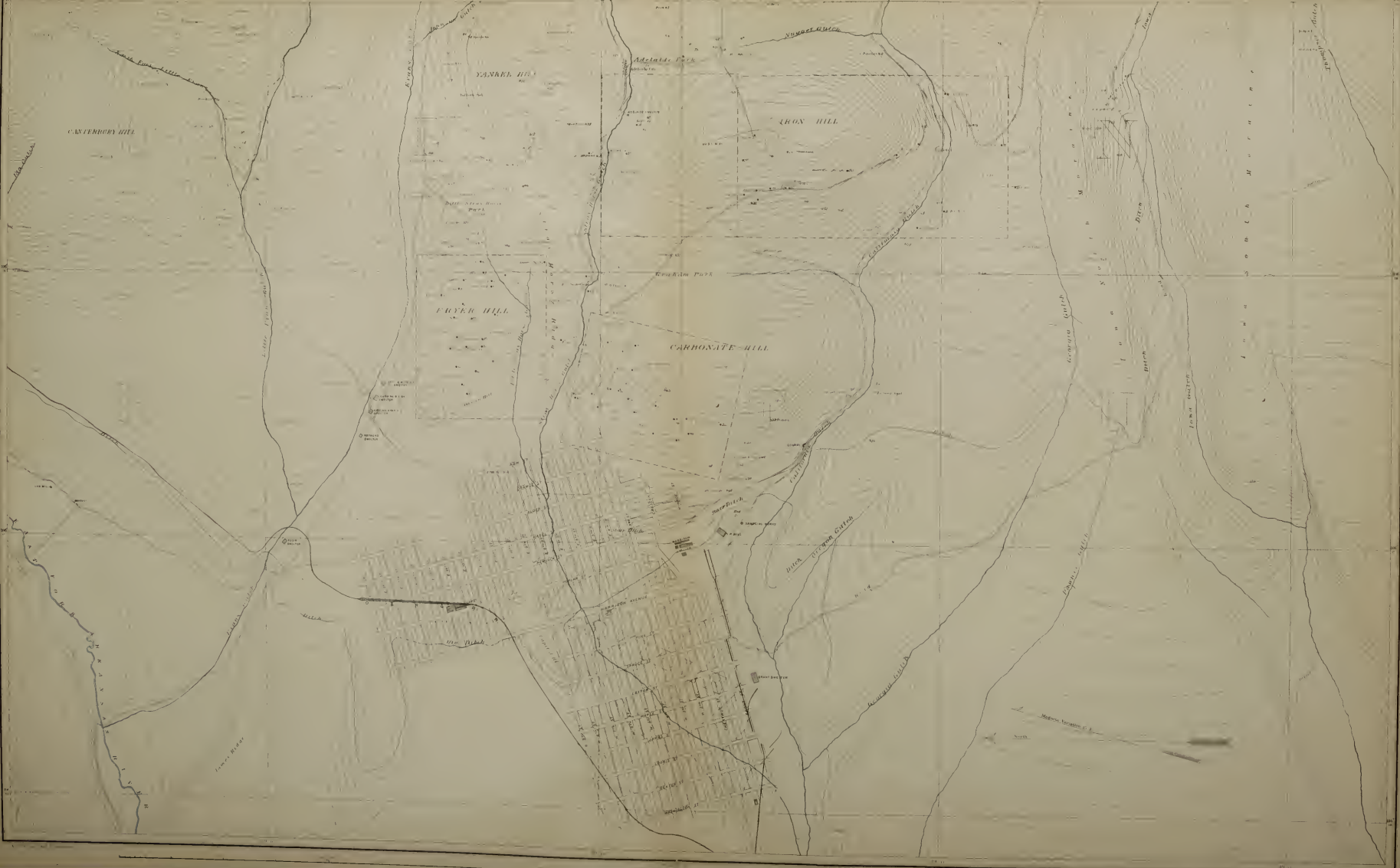
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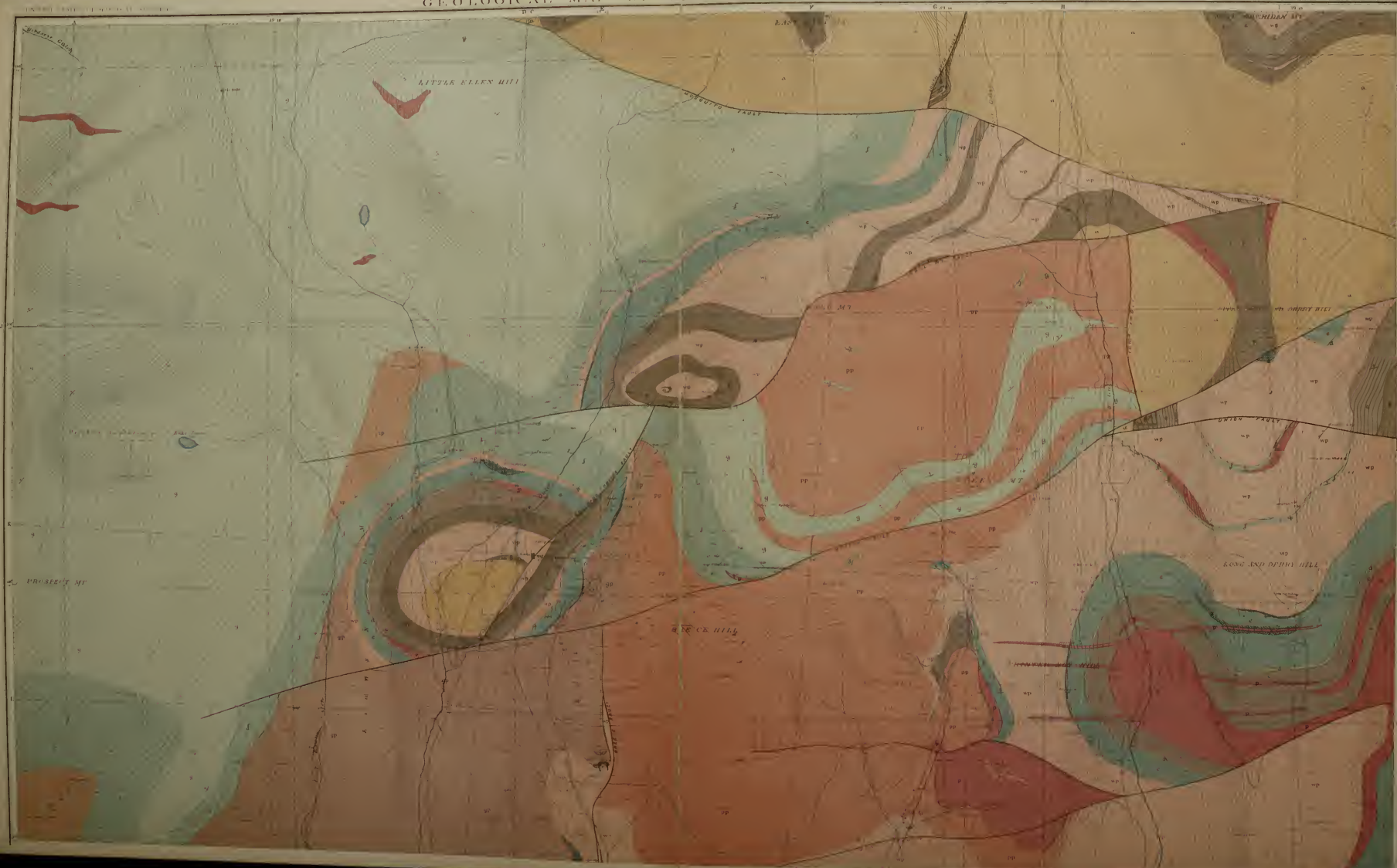


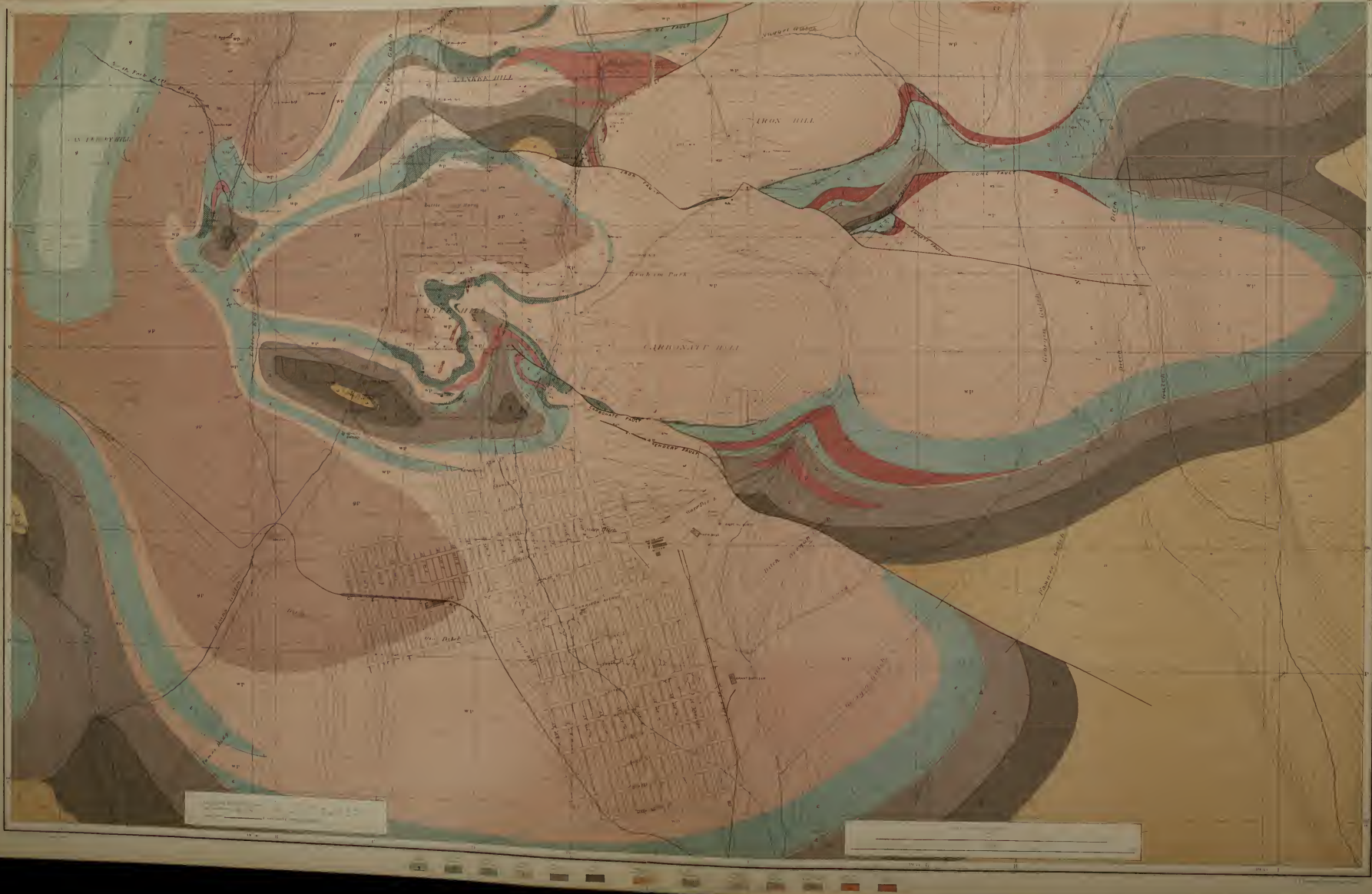
TOPOGRAPHICAL MAP OF LEADVILLE AND VICINITY

GEOLOGY OF LEADVILLE AREA SHEET 2

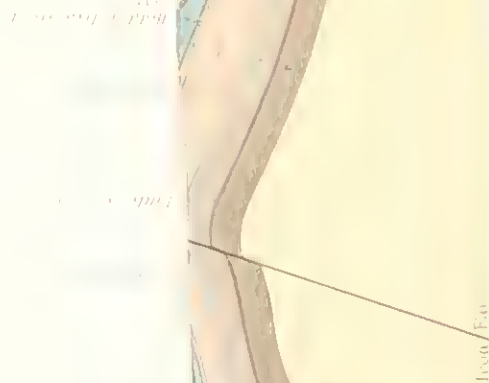
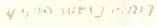






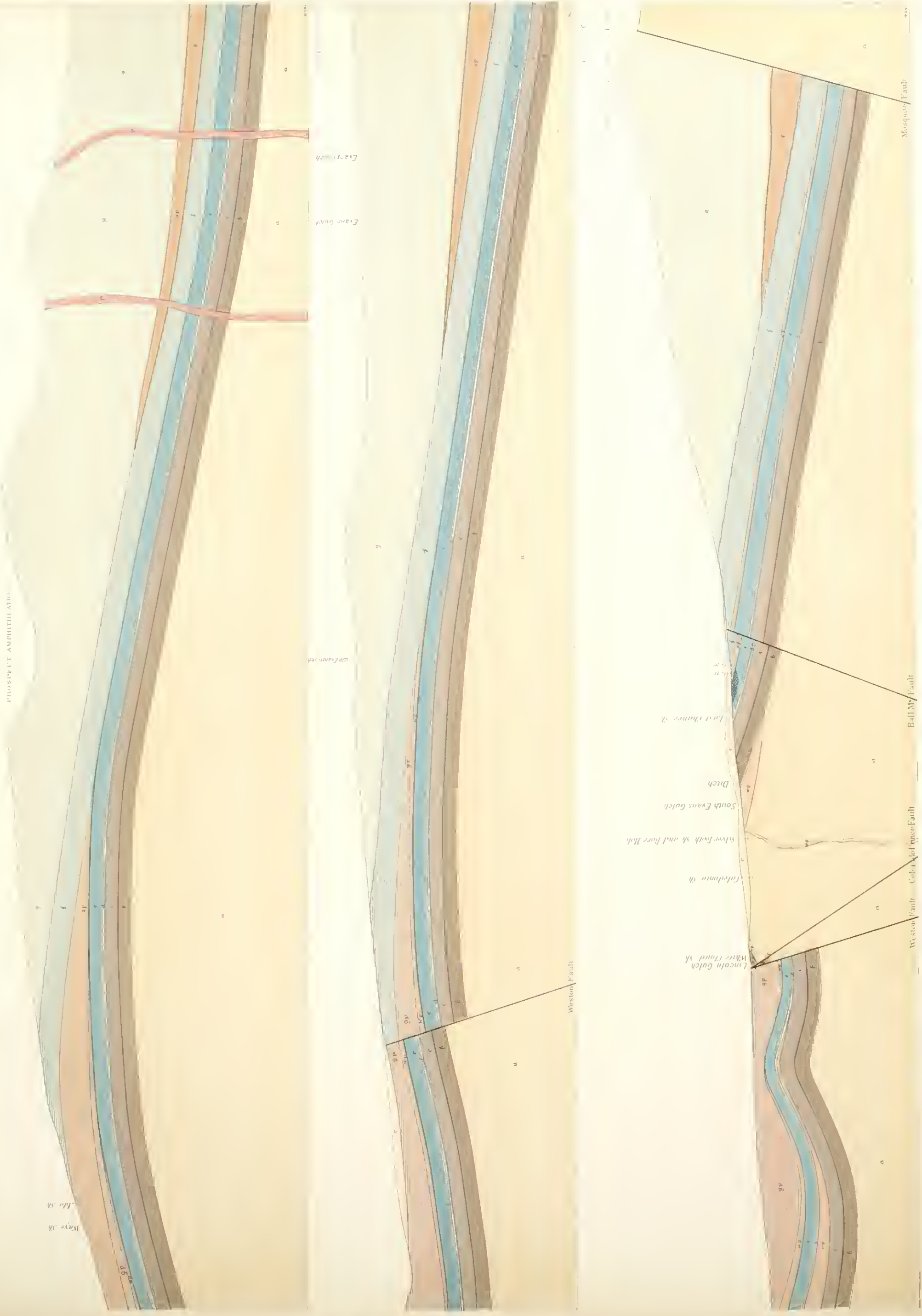


LEADVILLE AND VICINITY



STUDIES AND VICTIMS

PLATE 1



λ (nm)	T	$20\sigma_2$	$20\sigma_1$	λ (nm)
Recem				
		Weber lens		
		Weber Shale		
		Blue Line sm		
				Paring Quartz
				d

Werner
Schulze

Blue
Line

Q1

P
S
S

White
Lattice 9011-2

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Gravimetric
analysis

Seid
Macefoul

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White
Cotton

C

100

32


 100%
 TUBES



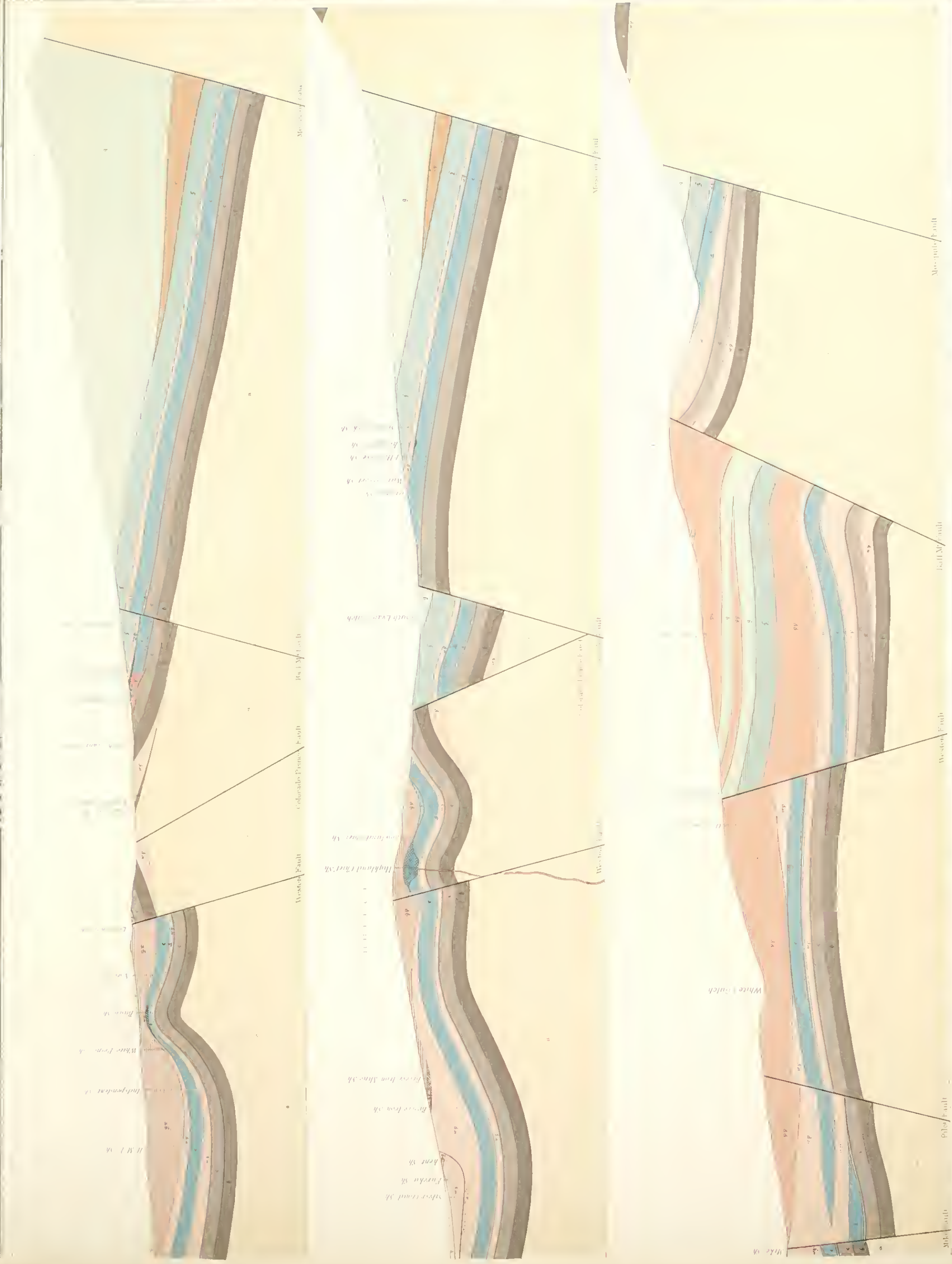
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LEADVILLE AND VICINITY

[illegible]

LEADERS AND FOLLOWERS



LEADSVILLE AND VICINITY

SECTION C



SECTION D



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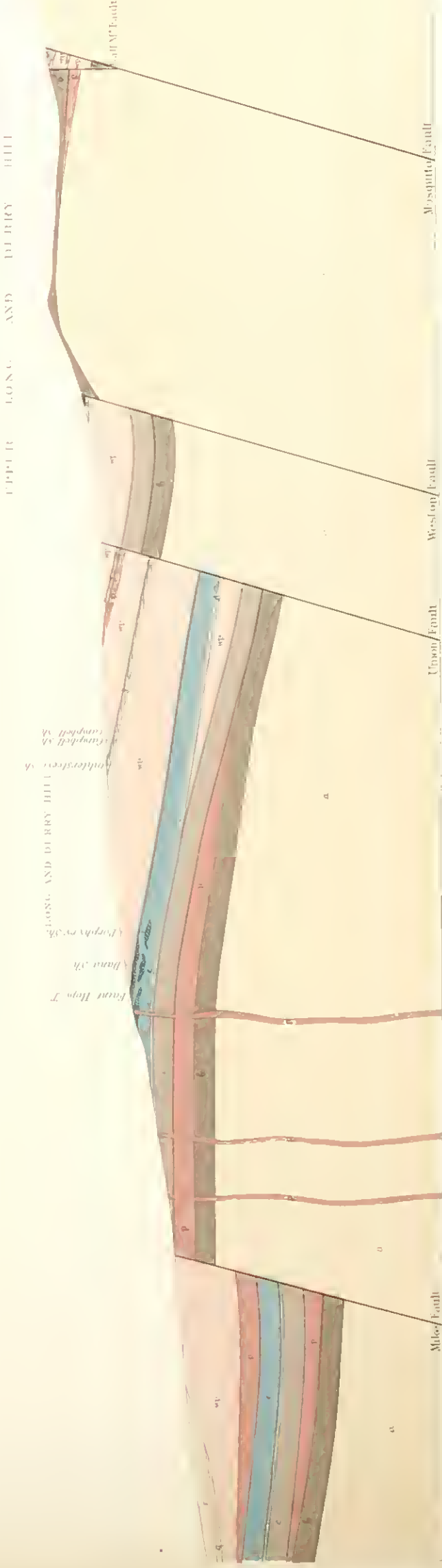
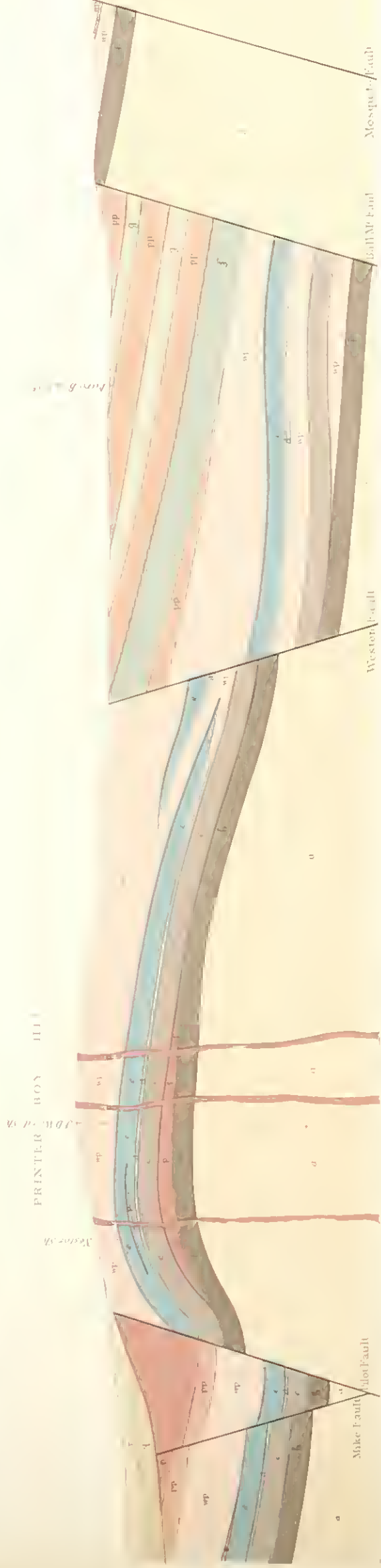
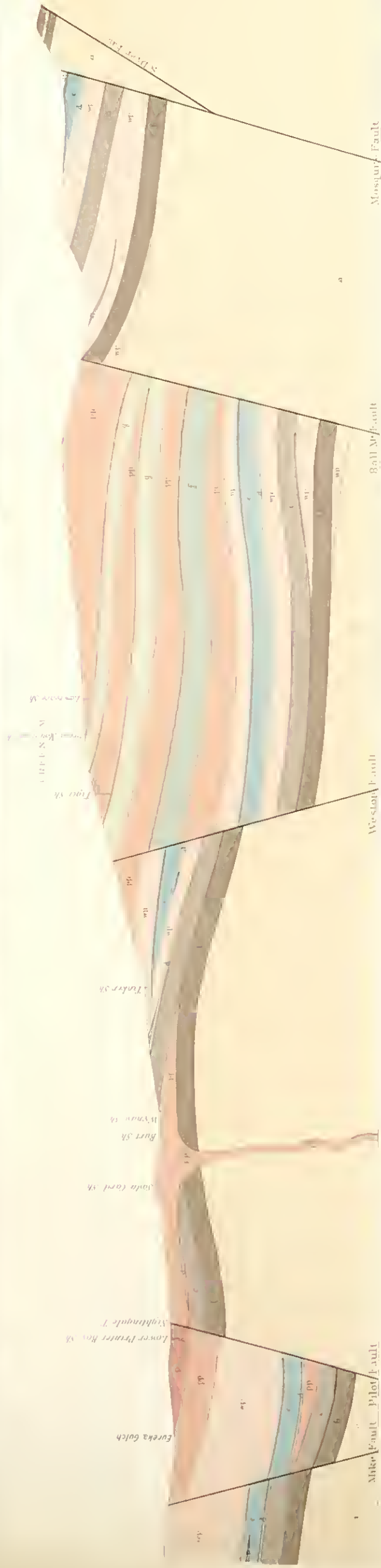
LEADVILLE AND VICINITY

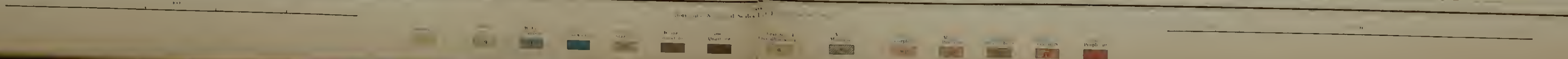
UNITED STATES GEOLOGICAL SURVEY

GEOLOGICAL MAP OF LEADVILLE AND VICINITY

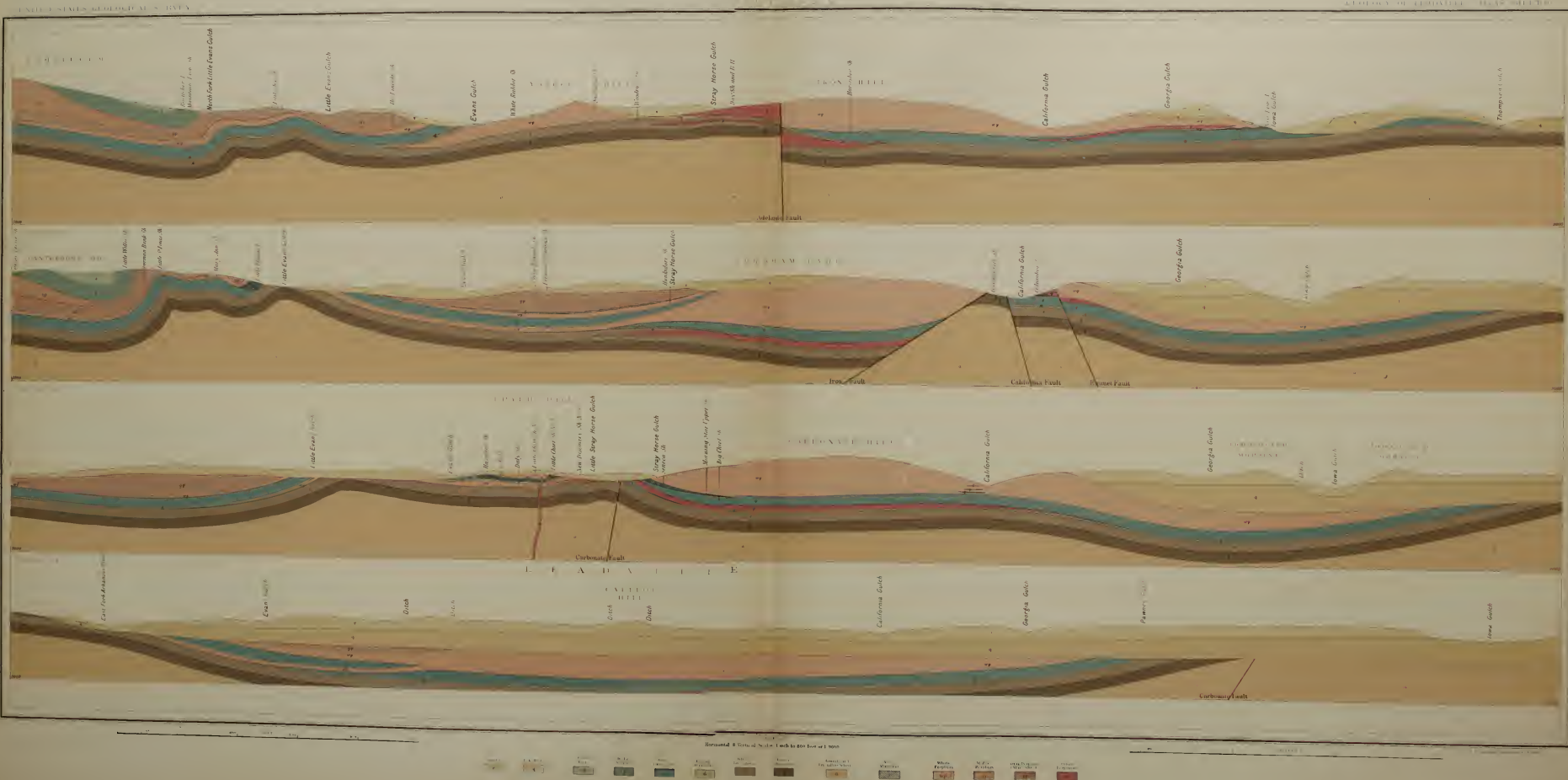
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LEADVILLE AND VICINITY



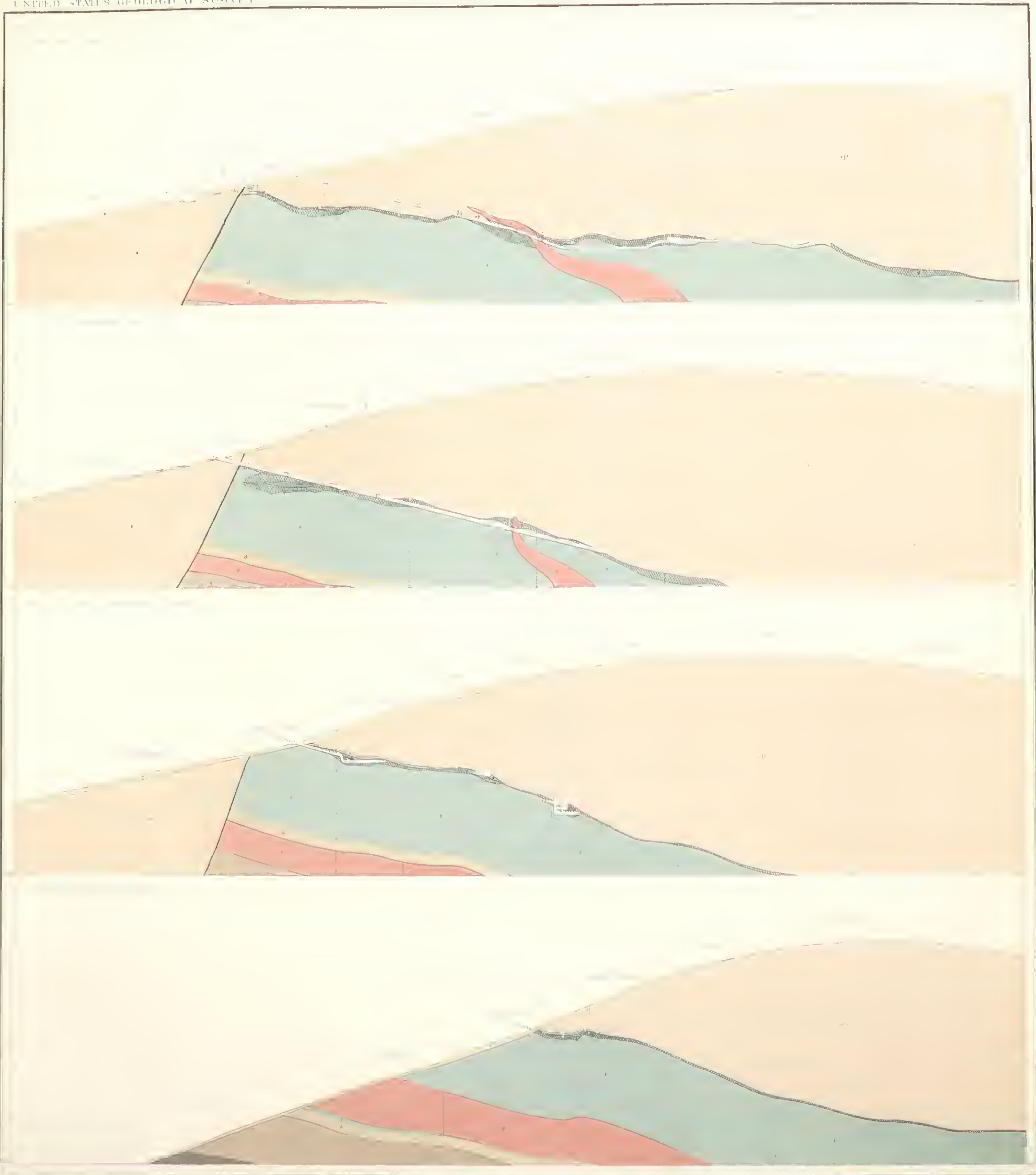


IRON HILL.

UNITED STATES GEOLOGICAL SURVEY

1901.

GEOLOGY OF LEADVILLE AREA, COLORADO



Horizontal Scale 1 inch = 1 mile

Scale of Feet

- | | | | | | | | | | |
|--------|------------|----------------|-------------------|-----------------|-----------------|----------------|----------|----------------|----------------|
| Recent | St. Albans | Blue Limestone | Parkman Quartzite | White Limestone | Lower Quartzite | Vermont Marble | Onondaga | White Porphyry | Other Porphyry |
| | | | | | | | | | |

IRON HILL,

IRON HILL



IRON HILL



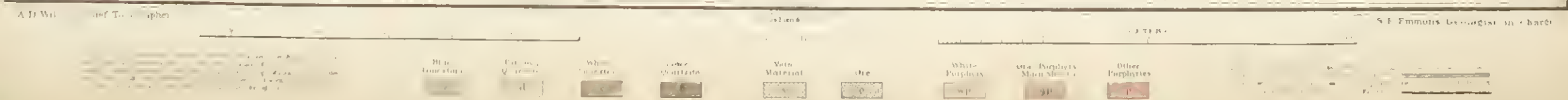
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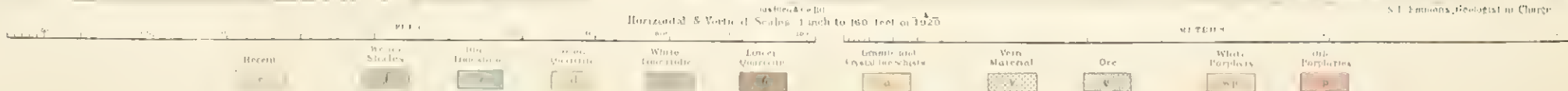
IRON HILL

Horizontal Scale





01000000 01010101 01000000 01000000 01000000 01000000 01000000 01000000



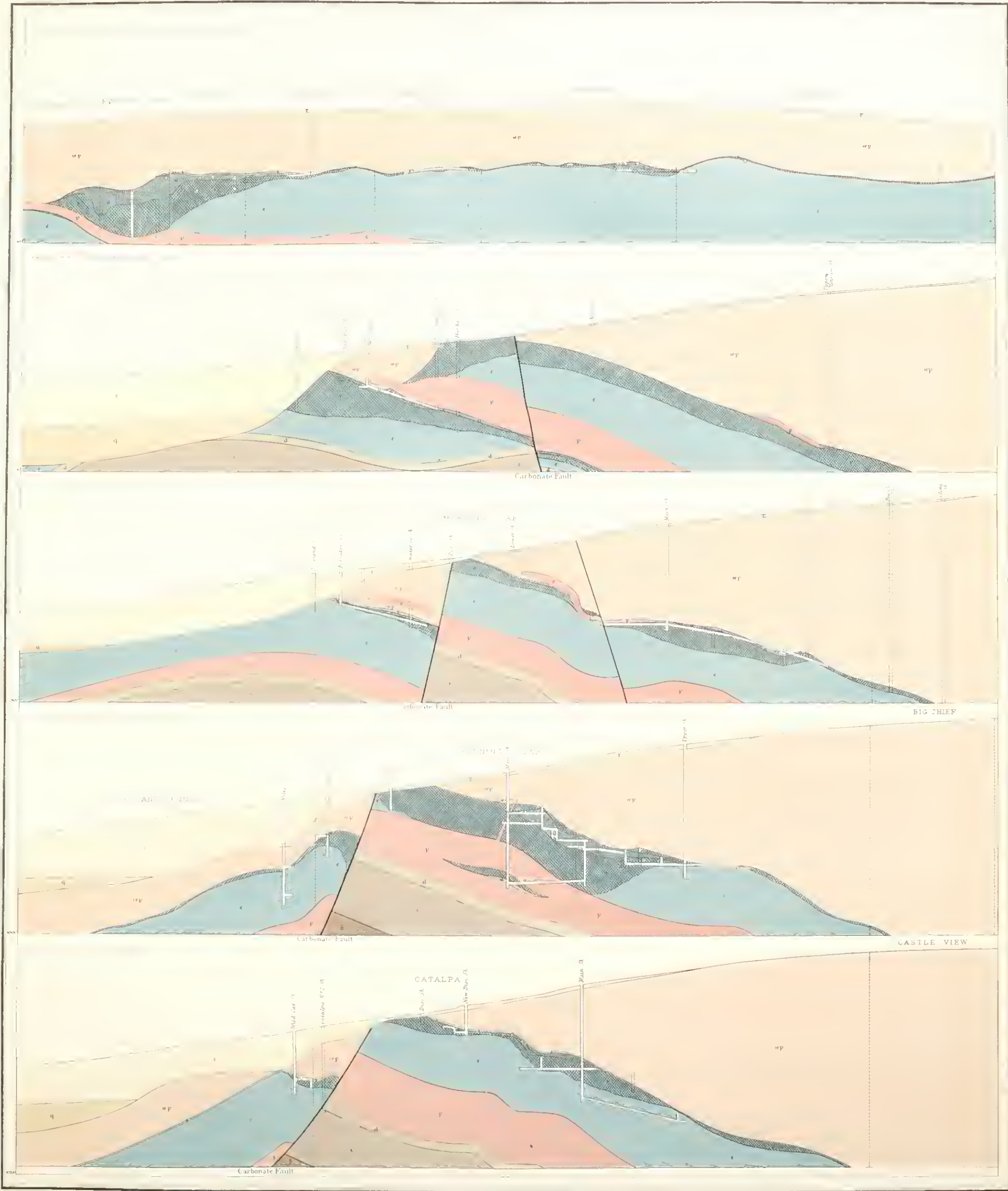


CARBONATE HILL

UNITED STATES GEOLOGICAL SURVEY

Geological Map

Geological Atlas Sheet

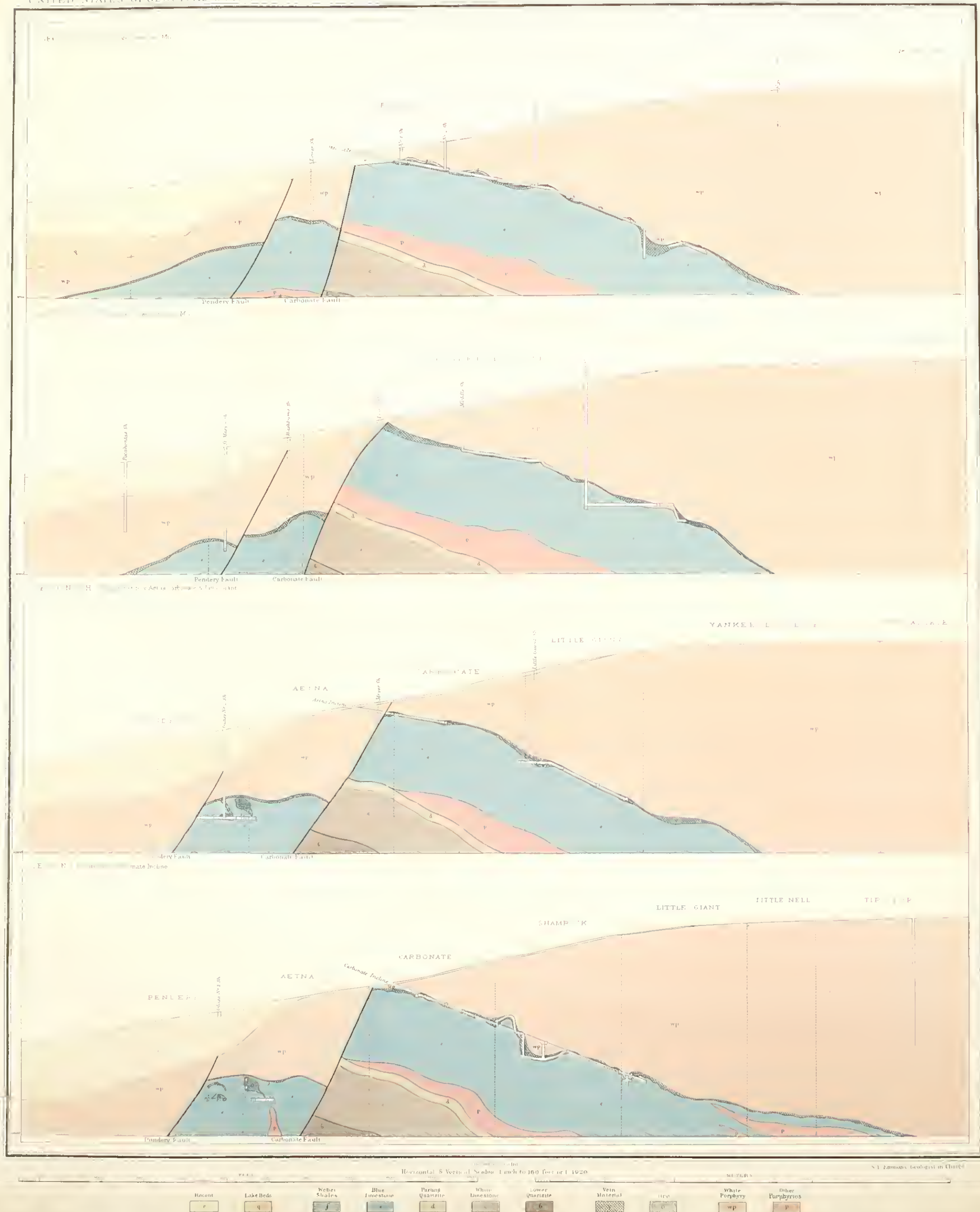


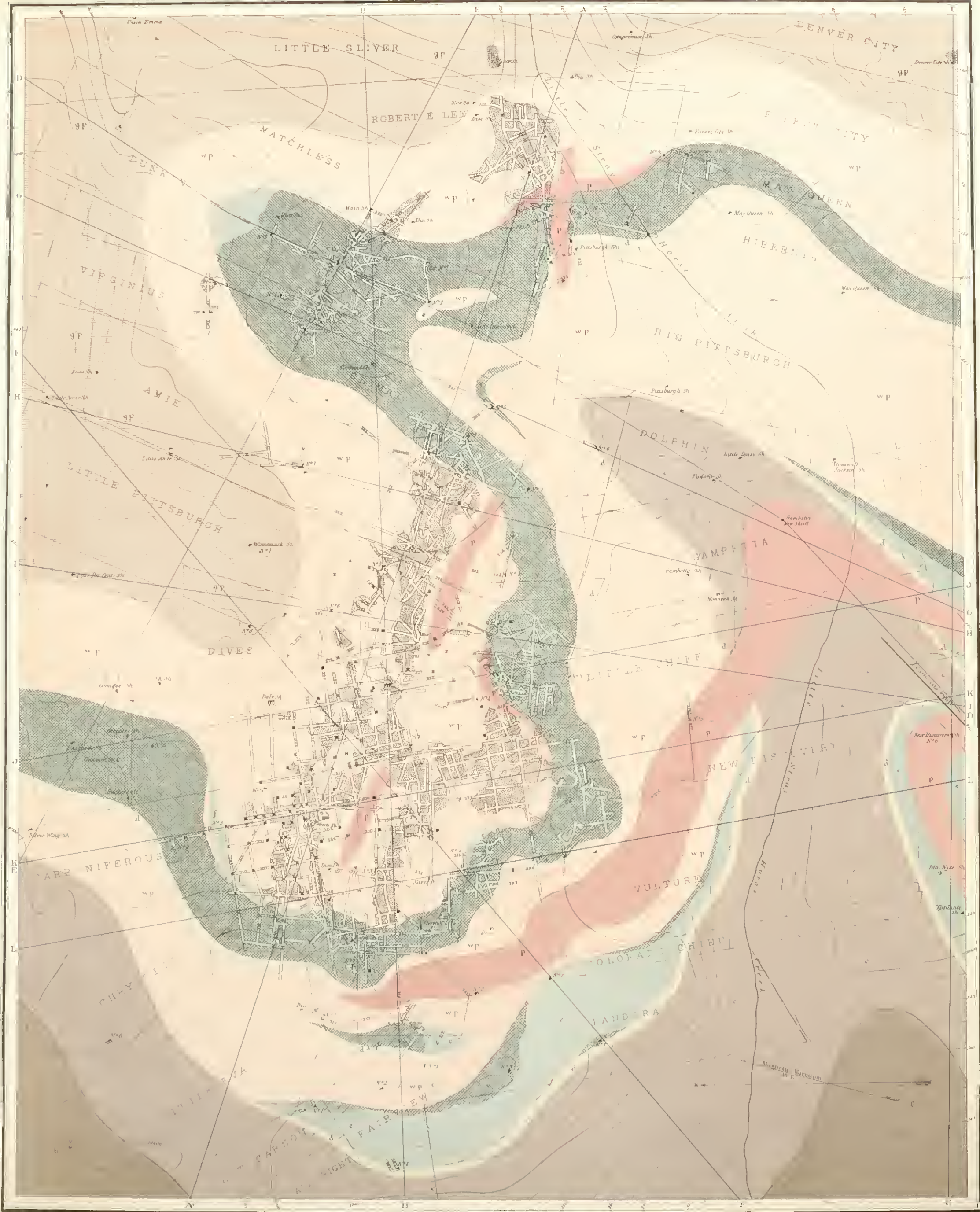
Horizontal & Vertical Scales 1 inch to 100 feet or 1:1020

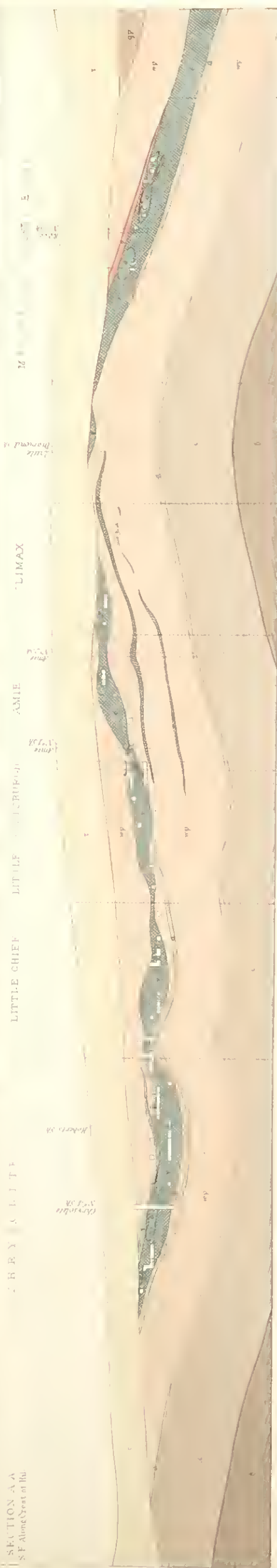
V.F. Emmons, Geologist in Charge

GEOLOGY OF LEADVILLE ATLAS SHEET XXX

UNITED STATES GEOLOGICAL SURVEY





SECTION A-A
S.F. Along Crest of Rd.

SKULLIN B B
C & W - Along (res) of H₁

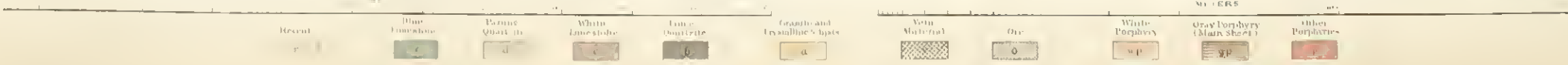


S.E. L. =
F. A. W. Allen. Sept. 1918. Ridge



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MUSEUM OF THE DIRECTOR
OF THE FAULT THROUGH THE

[illegible]



FRYER HILL

SECTION III

UNITED STATES GEOLOGICAL SURVEY

GEOLOGY OF LEADVILLE, COLORADO

SECTION I I. Through Little Purgatory mine

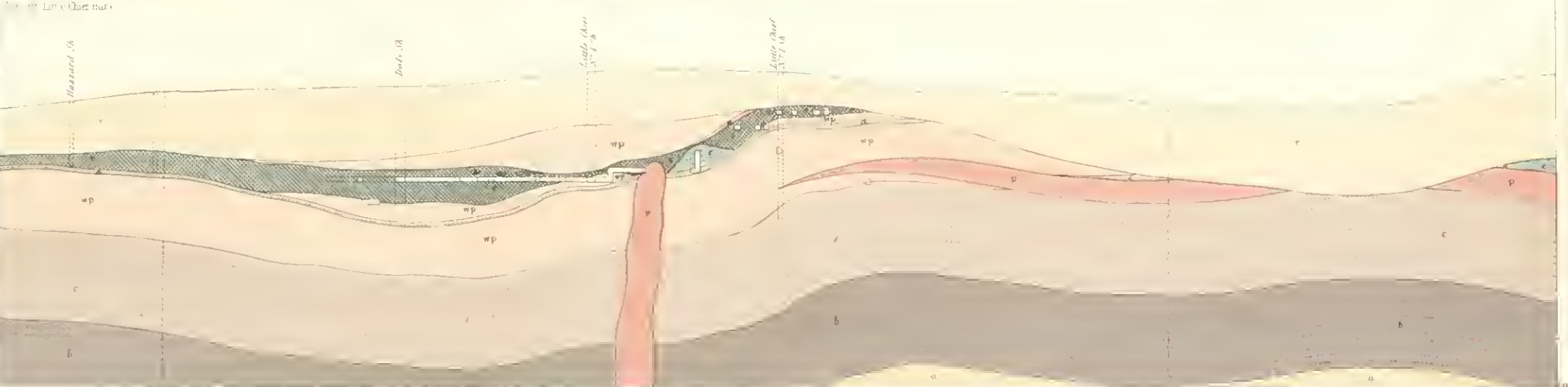
LITTLE PURGATORY

N. W.



SECTION II

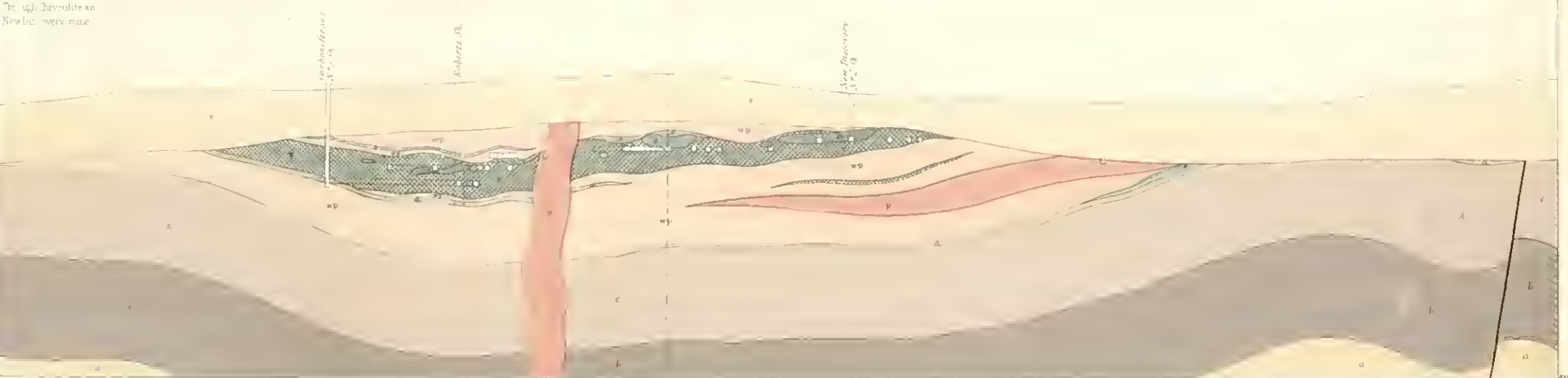
LITTLE PURGATORY



SECTION III

ARBONIFEROUS

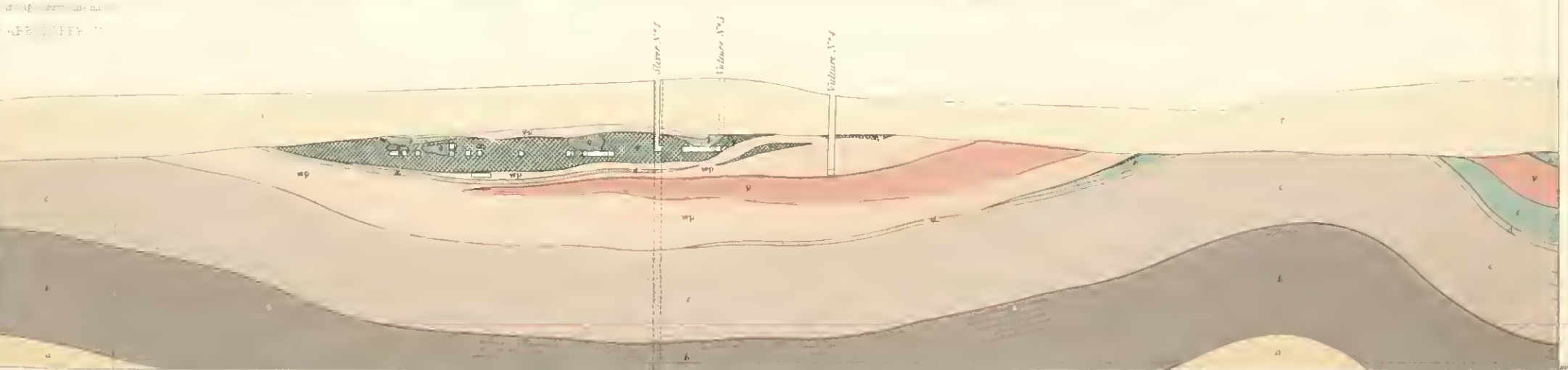
NEW DISCOVERY



SECTION IV

CHRYSLITE

NEW DISCOVERY - VULTURE



Horizontal & Vertical Scales 1 inch to 100 feet or 1:1020

S. F. Emmons, Geologist in Charge



INDEX TO SHAFTS, &c.

MAP OF LEADVILLE AND VICINITY.

N. E. Square, S. E. Square, S. W. Square, W. E. Square, and all parcels of the map, are numbered by alphabetical letters. When a shaft is located in a square, the letter of the square is placed before the number of the shaft. When a shaft is located in a block, the letter of the block is placed before the number of the shaft. When a shaft is located in a lot, the letter of the lot is placed before the number of the shaft. When a shaft is located in a street, the letter of the street is placed before the number of the shaft. When a shaft is located in a corner, the letter of the corner is placed before the number of the shaft. When a shaft is located in a block, the letter of the block is placed before the number of the shaft. When a shaft is located in a lot, the letter of the lot is placed before the number of the shaft. When a shaft is located in a street, the letter of the street is placed before the number of the shaft. When a shaft is located in a corner, the letter of the corner is placed before the number of the shaft.

Sh. indicates Shaft, T., Tunnel, In., Incline, B. H., Bore or Drill Hole

SQUARE B.		SQUARE G.		SQUARE L.		SQUARE O.		SQUARE Q.	
1. South Fork	Sh.	1. New Dollar	Sh.	1. Dexter	Sh.	1. Camp Hill	Sh.	1. Little St. Louis	Sh.
2. Elfenstein	Sh.	2. Trade Dollar	Sh.	2. Little Mac	Sh.	2. Silver Water (No. 2)	Sh.	2. Little St. Louis	Sh.
3. " "	Sh.	3. " "	Sh.	3. Watertown	Sh.	3. Bull's Eye (No. 2)	Sh.	3. Little St. Louis	Sh.
4. " "	Sh.	4. " "	Sh.	4. Pucupine	Sh.	4. Bull's Eye	Sh.	4. Little St. Louis	Sh.
5. " "	Sh.	5. " "	Sh.	5. Badger Fork	Sh.	5. Bull's Eye	Sh.	5. Little St. Louis	Sh.
6. " "	Sh.	6. " "	Sh.	6. Comstock	Sh.	6. Bull's Eye	Sh.	6. Little St. Louis	Sh.
7. " "	Sh.	7. " "	Sh.	7. Legal Tender	Sh.	7. Bull's Eye	Sh.	7. Little St. Louis	Sh.
8. " "	Sh.	8. " "	Sh.	8. Nighthawk	Sh.	8. Bull's Eye	Sh.	8. Little St. Louis	Sh.
9. " "	Sh.	9. " "	Sh.	9. Pay Rock	Sh.	9. Bull's Eye	Sh.	9. Little St. Louis	Sh.
10. " "	Sh.	10. " "	Sh.	10. Union	Sh.	10. Bull's Eye	Sh.	10. Little St. Louis	Sh.
11. " "	Sh.	11. " "	Sh.	11. Magic	Sh.	11. Bull's Eye	Sh.	11. Little St. Louis	Sh.
12. " "	Sh.	12. " "	Sh.	12. Frank	Sh.	12. Bull's Eye	Sh.	12. Little St. Louis	Sh.
13. " "	Sh.	13. " "	Sh.	13. Lady Alice	Sh.	13. Bull's Eye	Sh.	13. Little St. Louis	Sh.
14. " "	Sh.	14. " "	Sh.	14. P. L. R.	Sh.	14. Bull's Eye	Sh.	14. Little St. Louis	Sh.
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17. " "	Sh.	17. " "	Sh.	17. Little May	Sh.	17. Bull's Eye	Sh.	17. Little St. Louis	Sh.
18. " "	Sh.	18. " "	Sh.	18. Cumberland	Sh.	18. Bull's Eye	Sh.	18. Little St. Louis	Sh.
19. " "	Sh.	19. " "	Sh.	19. Glasgow	Sh.	19. Bull's Eye	Sh.	19. Little St. Louis	Sh.
20. " "	Sh.	20. " "	Sh.	20. Vanhook	Sh.	20. Bull's Eye	Sh.	20. Little St. Louis	Sh.
21. " "	Sh.	21. " "	Sh.	21. Lady Jane	Sh.	21. Bull's Eye	Sh.	21. Little St. Louis	Sh.
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31. " "	Sh.	31. " "	Sh.	31. " "	Sh.	31. Bull's Eye	Sh.	31. Little St. Louis	Sh.
32. " "	Sh.	32. " "	Sh.	32. " "	Sh.	32. Bull's Eye	Sh.	32. Little St. Louis	Sh.
33. " "	Sh.	33. " "	Sh.	33. " "	Sh.	33. Bull's Eye	Sh.	33. Little St. Louis	Sh.
34. " "	Sh.	34. " "	Sh.	34. " "	Sh.	34. Bull's Eye	Sh.	34. Little St. Louis	Sh.
35. " "	Sh.	35. " "	Sh.	35. " "	Sh.	35. Bull's Eye	Sh.	35. Little St. Louis	Sh.
36. " "	Sh.	36. " "	Sh.	36. " "	Sh.	36. Bull's Eye	Sh.	36. Little St. Louis	Sh.
37. " "	Sh.	37. " "	Sh.	37. " "	Sh.	37. Bull's Eye	Sh.	37. Little St. Louis	Sh.
38. " "	Sh.	38. " "	Sh.	38. " "	Sh.	38. Bull's Eye	Sh.	38. Little St. Louis	Sh.
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41. " "	Sh.	41. " "	Sh.	41. " "	Sh.	41. Bull's Eye	Sh.	41. Little St. Louis	Sh.
42. " "	Sh.	42. " "	Sh.	42. " "	Sh.	42. Bull's Eye	Sh.	42. Little St. Louis	Sh.
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45. " "	Sh.	45. " "	Sh.	45. " "	Sh.	45. Bull's Eye	Sh.	45. Little St. Louis	Sh.
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52. " "	Sh.	52. " "	Sh.	52. " "	Sh.	52. Bull's Eye	Sh.	52. Little St. Louis	Sh.
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81. " "	Sh.	81. " "	Sh.	81. " "	Sh.	81. Bull's Eye	Sh.	81. Little St. Louis	Sh.
82. " "	Sh.	82. " "	Sh.	82. " "	Sh.	82. Bull's Eye	Sh.	82. Little St. Louis	Sh.
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90. " "	Sh.	90. " "	Sh.	90. " "	Sh.	90. Bull's Eye	Sh.	90. Little St. Louis	Sh.
91. " "	Sh.	91. " "	Sh.	91. " "	Sh.	91. Bull's Eye	Sh.	91. Little St. Louis	Sh.
92. " "	Sh.	92. " "	Sh.	92. " "	Sh.	92. Bull's Eye	Sh.	92. Little St. Louis	Sh.
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97. " "	Sh.	97. " "	Sh.	97. " "	Sh.	97. Bull's Eye	Sh.	97. Little St. Louis	Sh.
98. " "	Sh.	98. " "	Sh.	98. " "	Sh.	98. Bull's Eye	Sh.	98. Little St. Louis	Sh.
99. " "	Sh.	99. " "	Sh.	99. " "	Sh.	99. Bull's Eye	Sh.	99. Little St. Louis	Sh.
100. " "	Sh.	100. " "	Sh.	100. " "	Sh.	100. Bull's Eye	Sh.	100. Little St. Louis	Sh.





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DO NOT
CIRCULATE

